Technics

QUARTZ

Direct Drive Automatic Turntable System SL-7 Operating Instructions

This apparatus was produced to "BS800: 1977"

Before operating this product, please read these instructions completely.

Although this unit requires no troublesome assembly or adjustment procedures, please be sure to read the sections in this instruction manual about removing packing material and making connections.

❶ Upper cabinet:
Contains tonearm drive mechanism.

❷ Record groove scale (1 mm pitch):
This scale is graduated in 1 mm indications. By noting the position of the tonearm LED you can determine the actual position of the tonearm in the record grooves.

❸ Tonearm LED:
This arrow-shaped LED lights up when the power is turned on (⏏), to show you the position of the tonearm as it traces the record grooves. By following the movement of the tonearm LED on the record groove scale, you can easily control cueing of the tonearm to the desired point on the record.

❹ Cartridge

❺ Stabilizer/stroboscope:
When the upper cabinet is closed, the stabilizer contacts the record label area to keep the record firmly in place. Around the circumference of the stabilizer is a stroboscope synchronized with the quartz oscillator reference frequency, so that you can easily confirm correct rotational speed (33-1/3 or 45 rpm).

❻ Stop button:
When you press the stop button, an LED (▶) lights up momentarily and the tonearm automatically returns to the start position and stops there.
(Auto-return, auto-stop.)
If you keep the button depressed, the tonearm will move outward (▶) toward the edge of the record. Press harder and the tonearm will move faster (▶▶).
If you press the cueing button to raise the tonearm, and then press the stop button intermittently, the arm will move outward in small steps.

❼ Start button:
When you press the start button, an LED (◀) lights up momentarily and the tonearm automatically moves to the record's lead-in groove and the record starts playing.
(Auto-start, auto-lead-in.)
If you keep the button depressed, the LED lights up and the tonearm moves inward (◀) toward the center of the record. Press harder and the tonearm will move faster (◀◀).
If you press the cueing button to raise the tonearm, and then press the start button intermittently, the arm will move inward in small steps.

❽ Cueing button:
Press the cueing button to raise or lower the tonearm. This is useful for temporarily interrupting record play, or for cueing the tonearm to a different selection on the record.
A muting circuit cuts out undesirable noise produced when the stylus tip initially contacts the record grooves (▼) or is raised (▼).

❾ Rep (repeat) button:
When you press the rep button, an LED lights up and the record is played repeatedly from beginning to end.
When you want to stop this cycle, merely press the rep button again. Pressing the stop button will cause the tonearm to rise and return to the start position; it will also stop repeat operation.

❿ Power switch:
When you press this button (⏏), the stroboscope and tonearm indicator light up.
When you press it again, everything turns off.

⓫ Cabinet lock button:
Press the cabinet lock button to unlock the cabinet. Then open the top gently. To close the cabinet, gently push it down until it clicks shut.

⓬ Dust cover

⓭ Light guide slits:
Infrared light passing through these slits is used for opto-electronic detection of record size (30, 25, 17 cm or 12", 10", 7").

⓮ Center spindle

⓯ 45 rpm adaptor:
This built-in adaptor is used for single-play 45 rpm records. Press down lightly on the adaptor while turning counter-clockwise and the adaptor will pop up ready for use. After use, press down and turn clockwise.

⓰ Turntable platter

⓱ Lower cabinet:
Contains turntable drive mechanism.

⓲ Speed select knob:
Turntable speed is chosen automatically according to opto-electronic detection of record size while the speed select knob is in auto-position. There is, therefore, no need to manually choose turntable speed or record size.
However, in those cases where speed does not correspond to standard record size (a 30 cm (12") 45 rpm record, or 17 cm (7") 33-1/3 rpm record, for example), you must manually select the correct speed by means of this knob.

⓳ Optical sensor:
This detects light coming through the guide slits in the platter and thereby detects the size of the record being played. It also detects whether there is a record on the platter or not.

⓴ Disc size selector:
Set this selector to the size of the record to be played when playing transparent records, records other than black or nearly transparent black records as these surfaces do not reflect the optical sensor beam.

㉑ Turntable mat

㉒ Stylus pressure adjustment screw

㉓ Arm lock

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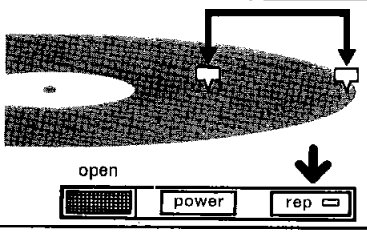

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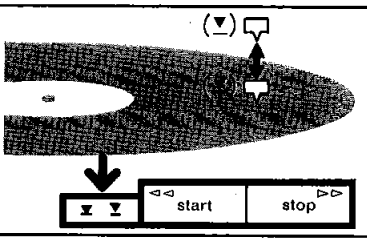

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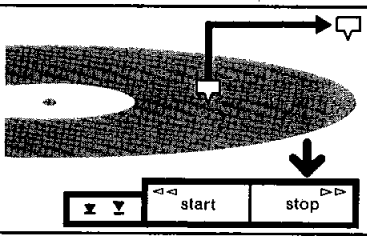

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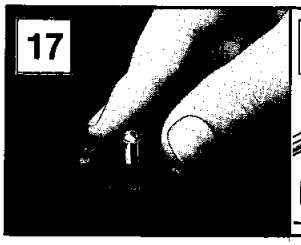

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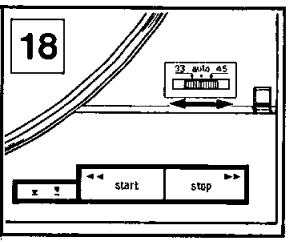

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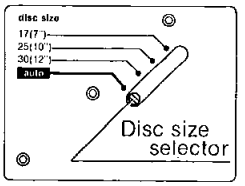

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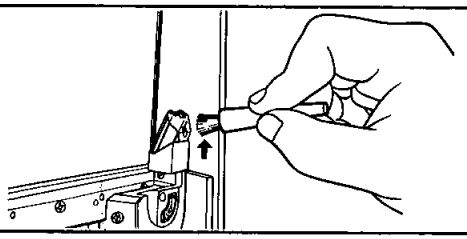

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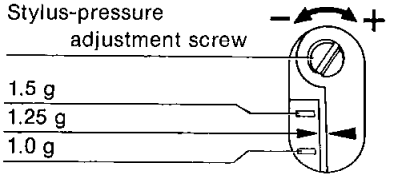

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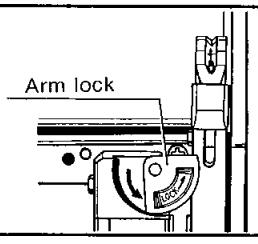

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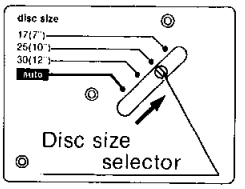

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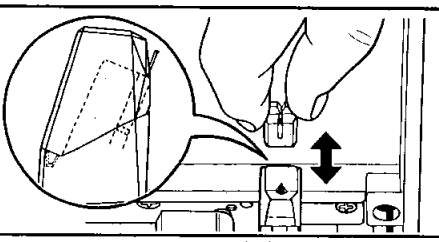

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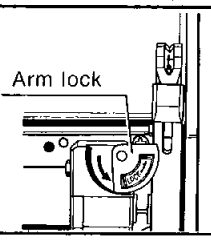

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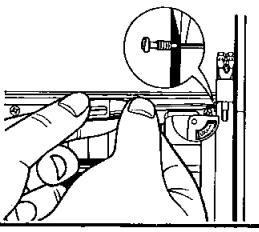

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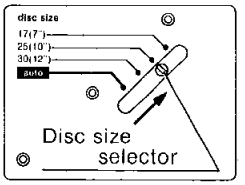

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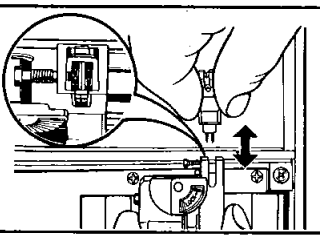

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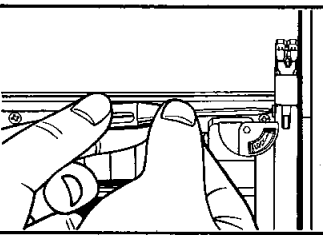

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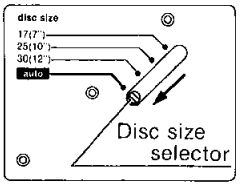


We want to thank you for selecting the SL-7.
For optimum performance, we recommend that you read these instructions carefully.

Caution for safe use of this apparatus (For UNITED KINGDOM)

Caution

- This apparatus is double insulated, safety earth not required.

Important

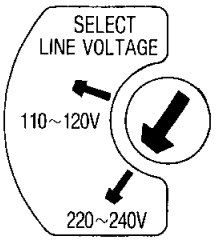
- **The wires in this mains lead are coloured in accordance with the following code:**

Blue:	**Neutral**
Brown:	**Live**

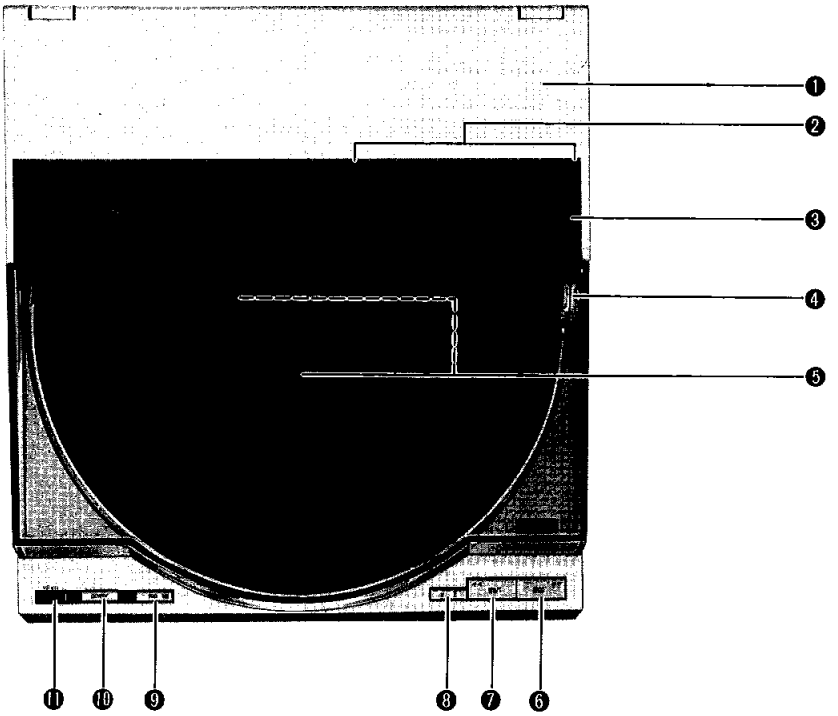
As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows.
The wire which is coloured **BLUE** must be connected to the terminal which is marked with the letter **N** or coloured **BLACK**. The wire which is coloured **BROWN** must be connected to the terminal which is marked with the letter **L** or coloured **RED**.

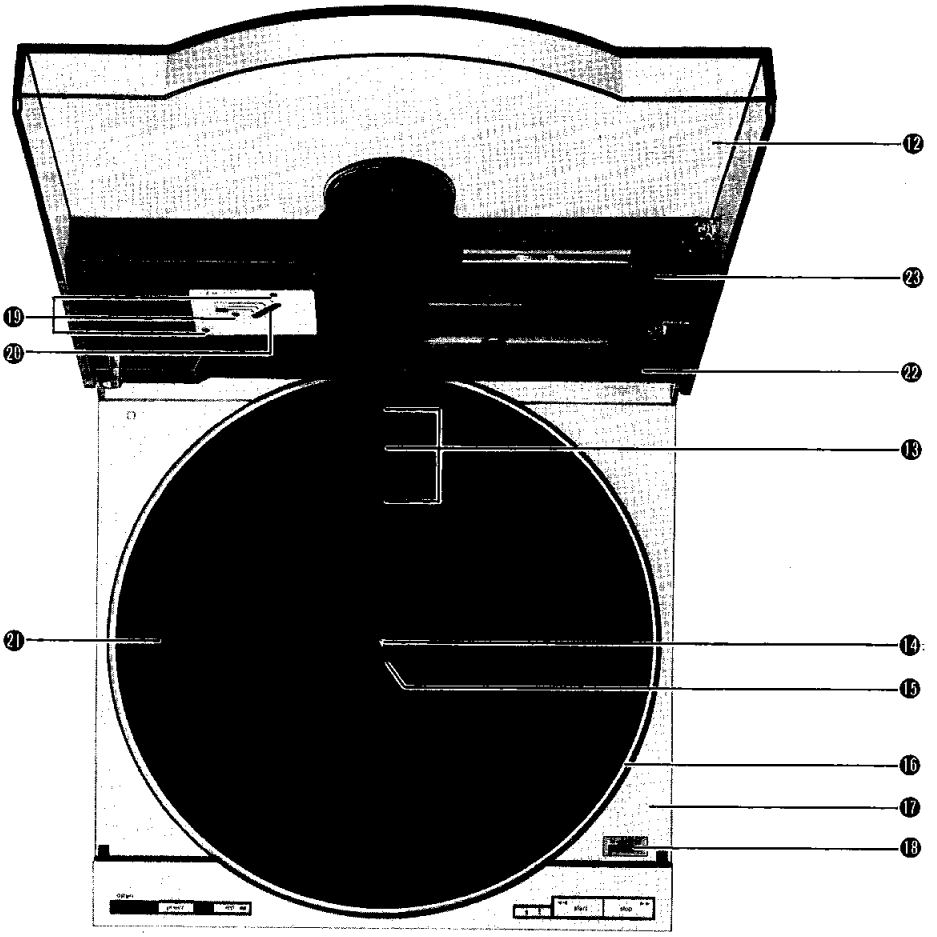
This equipment should be disconnected from the mains when not in use.

Caution:
Make sure that the turntable's AC line-voltage selector is matched to your local voltage before connecting the AC power plug.
Never connect to a DC socket.
If the pre-selected voltage is different from your local voltage, turn the AC line-voltage selector with a screwdriver so that it corresponds to your local voltage.
The AC line-voltage selector is located at the bottom of the base.



Parts identification and their functions





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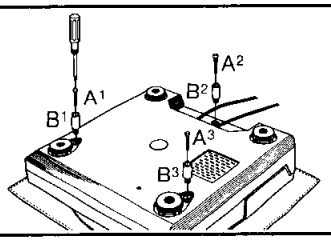

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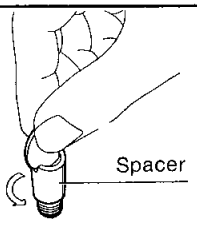

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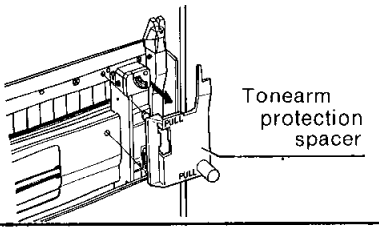

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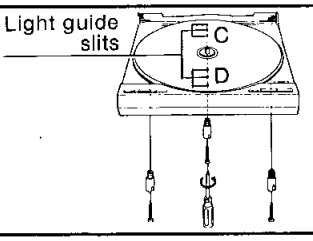

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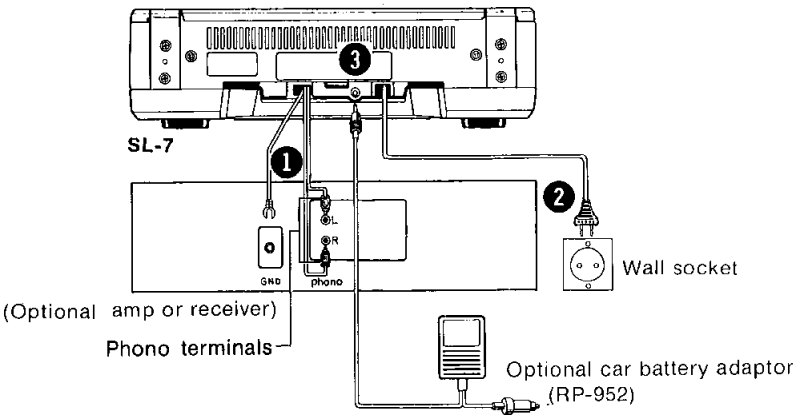

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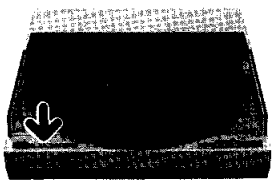

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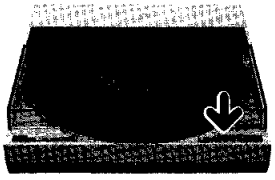

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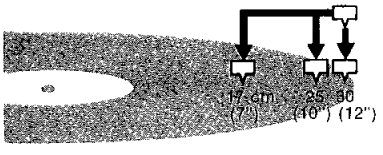

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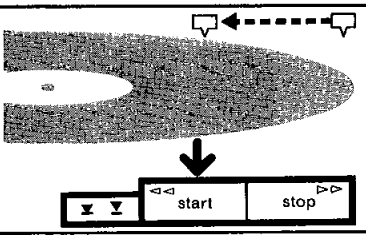

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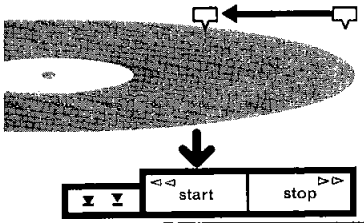

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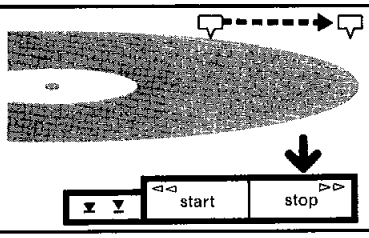

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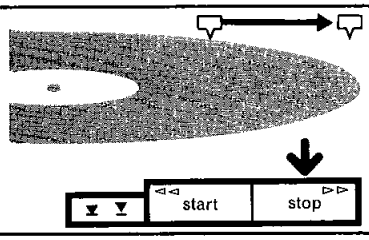

Removing packing material

1. Turn the unit upside down and completely unscrew locking screws A1, A2, and A3. **(Fig. 1.)**
2. Unscrew spacers B1, B2, and B3 (turn counterclockwise). Then remove spacers and washers, along with the screws. **(Fig. 2.)**
3. Turn the unit right side up and press the cabinet lock button on the upper cabinet to open it.
4. Pull off the tonearm protection spacer. Be careful not to touch the stylus. **(Fig. 3.)**

Notes:

1. When you turn the unit upside down, put it on a rug or soft cloth to avoid marring the cabinet top.
2. Keep all packing material and spacers, screws and washers in case you need to ship the unit at some future date.
3. To repack, proceed in the reverse order of that described above (4~1).
   However, be sure that the tonearm is all the way to the start position (at the outer edge of the platter).
   Note that the tonearm will not return to the start position if you press the power switch during play.
   Do not lock the tonearm when replacing the tonearm protection spacer.
4. There are three turntable locking screw holes; they are most easily aligned when the platter is turned so the light guide slits C, D are lined up as shown in the diagram. Note that there is a screw hole under only one of the slits. Turn the platter 180° to confirm this. **(Fig. 4.)**

Connections

❶ Connect the output terminals (Fig. 5.)

Output terminals		Amplifier or Receiver
L (White)	→	L Channel
R (Red)	→	R Channel
GND (Spade lug)	→	GND

Note:
Always connect the ground cord to the GND terminal on your amp or receiver to prevent hum.

❷ Connect the AC power plug (Fig. 5.)

Connect the AC power plug to an AC wall socket.

Caution:
Do not plug this unit into high voltage outlets intended for heavy duty appliances as this will cause a fire hazard and damage the unit.

❸ DC input jack (for DC power supply) (Fig. 5.) (⊖-◉-⊕):

This unit can be powered by either an AC or DC source. (Use only Panasonic car adaptor RP-952.)

Caution:
This unit takes a DC 12V power supply. Therefore, check the voltage and polarity of the adaptor you use. If the power supply drops below 10V, the SL-7 will not operate properly so be sure the battery is completely charged. The adaptor current capacity should be rated at 800mA or higher.
When using DC power from a car battery (via the cigarette lighter) or other source, plug the DC adaptor into this jack.
When you have the car battery adaptor plugged into the car's cigarette lighter, the adaptor's fuse may blow if you allow the adaptor's DC-in plug to touch a metal part of the car. Therefore, always unplug the adaptor from the cigarette lighter when not using it.
The adaptor's fuse may also blow if you allow the SL-7 cabinet to contact a metal part of the car, so be careful.

Placement

- **Place the unit in a stable position where there is little or no vibration.**
- **Locate the unit as far away from the speakers as possible and isolate the unit from sound radiation from them.**
- **Do not use or store this unit where it will be exposed to dust, dirt, high humidity or high temperature. Do not place it near heaters.**
  Do not place it near or on top of a power amplifier, since power amps radiate much heat.
- **Do not use under direct sunlight, spotlights, or other extremely bright light sources.**
  Bright lights may cause misoperation of the optical sensor system and therefore interference with automatic operation. This also applies to flashlights or infrared remote control units brought very close to the turntable.
- **Place the turntable away from the power amp to prevent hum.**
  Hum may be caused by leakage flux from the transformer in the power amplifier (or integrated amp). Therefore, if you notice hum, try moving the turntable to a slightly different location, further away from the amp.
- **Keep it in a well ventilated place.**
- **When a radio is placed too close to the turntable and is played while the turntable is in operation, interference to AM/FM reception may result.**
- **We do not recommend operating this unit while driving an automobile.**

How to operate

Auto-play
(Basic procedure)

1 record (Fig. 6.)

- Press the cabinet lock button and open the cabinet gently.
  Note:
  Always remember to release the lock by pressing the cabinet lock button before attempting to open the cabinet top.
- Place a record on the turntable mat.

2 on (Fig. 7.)

- Close the cabinet gently.
- Press the power switch to turn on the unit (⏏). The tonearm indicator and stroboscope will light up.
  Note:
  It is best to turn amplifier volume all the way down before turning on the power switch.

3 start (Fig. 8.)

- Press the start button.
  Note:
  Wait about two seconds after you turn on the unit before pressing the start button.
  This assures dependable and accurate operation.
- The optical sensor will detect the record size and determine record speed. According to size and speed, the tonearm will automatically move to the lead-in groove and play will begin. **(Auto lead-in, auto-start.) (Fig. 9.)**

- When there is no record on the turntable mat, the turntable platter will rotate once or twice but tonearm will not move, thanks to the superb record detection design.
- At the end of the record the tonearm rises and automatically returns to the start position.
  (Auto-return)
- After the tonearm returns to the start position press the power switch to turn off the unit (⏏).
  Note:
  If you press the start button for less than one second while a record is being played, the tonearm returns to the lead-in groove and begins playing the record again. The LED above the rep (repeat) button flashes on and off to indicate that this is happening.

■ Selective play

(Multi-function operation)

◀◀start button

■ For normal and fast inward cueing

- Press the cueing button to raise the tonearm, then press the start button to move the tonearm inward (toward the center of the record).
- The tonearm will keep moving inward as long as you keep the start button depressed.
- If you press the start button intermittently, the tonearm will move inward in small steps. **(Fig. 10.)**
- When you release the start button, the tonearm will stop at the position it has reached.
- Press the cueing button again to lower the tonearm back onto the record and begin play.
- If you press the start button harder, the tonearm will move inward faster. **(Fig. 11.)**

Refer to the Quick Reference Chart on page 13 for more about start and stop button operation.

stop▶▶ button

■ For normal and fast outward cueing

- The tonearm moves outward (towards the edge of the record) as long as you keep pressing the stop button (after raising the tonearm by pressing the cueing button).
- If you press the stop button intermittently, the tonearm will move outward in small steps. **(Fig. 12.)**
- The tonearm will stop at the position it has reached when you release the stop button.
- When you press the cueing button again, the tonearm will be lowered onto the record and play will begin.
- If you press the stop button harder, the tonearm will move outward faster. **(Fig. 13.)**

  Note:

  A safety feature of this unit is that the tonearm can only be cued between the lead-in and lead-out grooves. Therefore, you cannot cue the tonearm all the way back to the start position at the edge of the platter in the case of 17 cm (7") and 25 cm (10") records. Instead, press the cueing button once again to lower the tonearm onto the record, then press the stop button.

rep ▬ repeat button

■ For repeat play

- Press the repeat button and the repeat indicator LED will turn on to indicate that the record will be played again. **(Fig. 14.)**
- To stop the repeat cycle, press the repeat button again.
- Pressing the stop button or power switch will also stop repeat operation.

▼ ▼ cueing button

■ For raising or lowering the tonearm during play (Fig. 15.)

- When you press the cueing button, the tonearm rises up from the record surface.
- Press the cueing button again to lower the tonearm onto the record surface and begin play again.

■ For auto-return or reject during play

- If you press the stop button during play (without first pressing the cueing button), the tonearm will rise and return to the start position and the platter will stop rotating. **(Fig. 16.)**
- Auto-return (reject) operation will not take place if the stop button is depressed while the tonearm is raised above the record surface.

■ For playing 45 rpm records (Fig. 17.)

- Press down lightly on the 45-adaptor while turning counter-clockwise. The adaptor will pop up above the platter surface.
- 17 cm (7") diameter 45 rpm records are automatically played at 45 rpm, thanks to optoelectronic detection of record size when the speed select knob is in the auto position.

■ For playing non-standard records (Figs. 18, 19.)

- When playing larger than normal diameter 45 rpm records or smaller than normal 33-1/3 records, open the cabinet and turn the speed select knob to the appropriate speed setting. Record size will still be detected automatically.
- For other than black records (transparent, colored, or black that does not reflect light), set the disc size selector to the appropriate setting for the record to be played. The method of operation is then the same as that described for auto playback.

  Note:

  Always leave the disc size selector at the auto position when playing records that are not transparent.

  If left at the 17 (7"), 25 (10") or 30 cm (12") position, there is a danger of damaging the stylus because the tonearm may descend onto the platter surface even if there is no record present.

Notes and maintenance

■ **Turn down amplifier volume (preferably all the way) before turning the power switch on (⎓) or off (⏏).**
This protects your ears and the speakers from switching noise.

■ **Make sure the power switch is off before unplugging or plugging in the AC cord.**

■ **Auto-return operation will not function if you press the power switch while a record is being played.**
The tonearm will rise above the record surface but stay where it is.
Therefore, if you then press the switch again to turn it on, the tonearm will go back to the start position.

■ **Be sure to remove all dirt and dust from the stylus tip. (Fig. 20.)**
The cartridge stylus is an extremely delicate and precisely manufactured device desiged for picking up the subtle nuances of the record grooves. Therefore, be very careful not to touch it or push on it or apply excessive force in any way.
The stylus tip can not retain proper groove contact when it is dirty. This causes bad sound reproduction and excess wear on the stylus tip and grooves. Therefore, use the accessory brush to remove dust and dirt by brushing upward, as shown in the diagram. Also, use a good record cleaner to remove dust and dirt from the grooves.

■ **If there is no record on the turntable mat, the tonearm will not move, even if you press the start button.**
This unit uses an optical sensor to detect record size and whether there is a record on the turntable mat or not.
If no record is on the mat, the turntable will rotate once or twice and the optical sensor will detect the fact that no record is present. Therefore, the tonearm will not move.
This safety feature prevents accidental damage to the stylus tip and cartridge.
This also means that if you place a transparent record (its color may be red, green, yellow, blue, etc.) on the turntable mat, the turntable will operate as if there was no record.

■ **Use the selective play procedure for records that do not meet industry standard dimensions.**

■ **Wipe the dust cover and cabinet with a soft, dry cloth.**
Never use any cleaners containing alcohol, benzine or thinner.
Use of a chemical dust cloth should also be avoided. Be sure that the dust cover is not exposed to insecticide spray.
To remove stubborn fingerprints or grease spots, disconnect the AC power plug.
Use a soft cloth slightly moistened with a mild soap-and-water solution.
Do not wipe the dust cover during play, or the tonearm may be attracted toward the dust cover due to the generation of static electricity.

■ **Please open the upper cabinet gently.**
Always remember to press the lock button before trying to lift up the cabinet top.
Open the top gently; it is designed to stop at a 60° angle.
When you need wider access, when changing the stylus or cartridge, for example, you can open the cabinet top to a maximum of 90° by pushing further while holding down the lower cabinet with your other hand.

■ **Always be sure the cabinet is closed tightly.**
If the cabinet is not locked, the stylus tip will not maintain optimum contact with the record grooves. Also, open and close the cabinet carefully.

■ **Do not open the upper cabinet unless the lower cabinet is supported (when using the unit upright or on its side).**
Also, hold onto the upper cabinet when you open it when using the unit on its side or upright.
If the cabinet is allowed to open suddenly, it may cause damage.

■ **Adjust the stylus pressure in the following cases. (Fig. 21.)**
Stylus pressure is normally set to 1.25 grams but may be raised or lowered by ±0.25 grams.
It may be necessary to increase stylus pressure when playing records cut at high levels, or when room temperature is low, or when the unit easily picks up external vibrations. This will help prevent distortion and groove-skipping.
To adjust stylus pressure, turn either way, as shown in the diagram. The screw is coupled to the graduated ring.
Note:
Do not turn the stylus-pressure adjustment screw further than the set limits (1.5 g ~1.0 g).

Caution:
Never attempt to move the tonearm by hand.
This may seriously damage the delicate tonearm drive mechanism. If the arm does not respond to the normal operating procedure as outlined in this booklet, consult your nearest authorized servicenter.

Replacement of stylus

This unit is equipped with an elliptical diamond stylus. The life of the stylus varies according to the conditions of use.

Noise or scratchiness may indicate a worn or damaged stylus. To prevent damage to your records, the stylus should be replaced at the first sign of wear.

You will have easier access to the stylus with the tonearm toward the center.

Therefore, follow the instructions below.

1. Press the lock button to release the cabinet top. Then open the top gently.
2. Turn the arm lock in the direction of the arrow to lock the tonearm. **(Fig. 22.)**
3. Set the disc size selector to the 25 cm (10") position. **(Fig. 23.)**
4. Gently shut the cabinet top and turn on (⏻) the power switch.
   Note:
   Be sure you have the amp volume knob turned down all the way to avoid amplification of shock noise produced when handling the stylus.
5. Press the start button. The tonearm will move over to the 25 cm (10") record lead-in groove position and stop.
6. Turn off (⏻) the power switch. Press the lock button, and open the cabinet top.
7. Remove the old stylus by pulling in the direction of the arrow. Then push in the new stylus, while being careful not to touch the stylus tip. **(Fig. 24.)**
8. Turn the arm lock back to its original position.
9. Return the disc size selector to the auto position.

Replacement of cartridge

Although this unit comes equipped with a high performance MM cartridge as standard equipment, it is also possible to use any other kind of plug-in connector type hi-fi cartridge. However, if you mount the Technics EPS-310MC moving cartridge, a separate MC pre-preamp is required to boost the signal before it is sent to the preamplifier. We recommend that you use the Technics SU-300MC pre-preamp.

1. Press the lock button to release the cabinet top. Then open the top gently.
2. Turn the arm lock in the direction of the arrow to lock the tonearm. **(Fig. 25.)**
   Note:
   Be sure you have the amp volume knob turned down all the way to avoid amplification of shock noise produced when handling the cartridge.
3. Use the screwdriver (supplied) to loosen the cartridge mounting screw. (As shown in the illustration, loosen the screw until it hangs free.) **(Fig. 26.)**
   Note:
   As with the stylus replacement procedure, it is easier to change or replace the cartridge with the tonearm toward the center of the turntable.
4. Set the disc size selector to the 25 cm (10") position. **(Fig. 27.)**
5. Gently shut the cabinet top and turn on (⏻) the power switch.
6. Press the start button. The tonearm will move over to the 25 cm (10") record lead-in groove position and stop.
7. Turn off (⏻) the power switch. Press the lock button, and open the cabinet top.
8. Remove the cartridge. **(Fig. 28.)**
9. Being careful not to touch the stylus tip, line up the new cartridge's connector pins with the tonearm connector and insert firmly into place.
10. Turn on (⏻) the power switch. The tonearm will return to the start position.
11. Finally, tighten the cartridge mounting screw. **(Fig. 29.)**
12. Turn the arm lock back to its original position.
13. Return the disc size selector to the auto position. **(Fig. 30.)**

Features

1. High performance direct drive unit the size of a record jacket

The SL-7 consists of an upper and lower cabinet. The upper cabinet is made of precision aluminum diecast to assure a high degree of accuracy and includes the linear tracking tonearm, tracking control circuitry and optical sensor.
The lower cabinet, made of zinc diecast to give the unit sufficient mass, holds Technics' original integral rotor/platter direct drive motor and its control circuitry. It's hard to believe that it all fits in a unit the size of a record jacket.

2. Just put on a record and press the start button.

Thanks to the optical sensor and microcomputer, both record size and record speed are detected automatically so all you have to do is press the start button to begin play.
At the end of the record, the tonearm automatically rises and returns to the start position.
When there is no record on the turntable, the tonearm does not move, so there is no danger of harming the stylus accidentally.

3. Dynamic balanced linear tracking tonearm employs optical sensor and groove deflection angle detection for extremely stable and accurate tracking.

The linear tracking tonearm moves across the record surface in the same way as the cutter head used to make the record in the first place. Therefore there is virtually no tracking error or skating force.
Located by the stylus is an optical sensor that detects tracking conditions by means of groove deflection angle. Based on this information, tonearm movement is controlled to maintain optimum tracking at all times. Because the tonearm is dynamically balanced, the turntable can be played horizontally or vertically.

4. Complete multi-function control capability.

Besides the simple, basic operating procedure described above, you also have complete selective control over all tonearm and turntable functions.

5. A precision coreless DC motor is used for tonearm drive to assure quiet and accurate control.

The coreless DC motor and slide bearing of minimum friction assure extremely precise tonearm movement.
A 4-point pivot bearing gimbal suspension developed by Technics reduces friction and raises sensitivity while contributing to smooth tracing ability.

6. MM cartridge with pure boron pipe cantilever and excellent physical characteristics for faithful sound reproduction

The SL-7 is equipped with the Technics developed EPC-100CMK2 cartridge with pure boron pipe cantilever, the first in the world. Boron greatly reduces the effective mass of the moving system while the one-point suspension system provides an accurately defined point of support. Technics original cartridge technology is employed throughout this cartridge to give you the rich, realistic sound you've always wanted.

7. Other advanced features:

- Technics' original integral rotor-platter structure combines motor rotor and platter for more stable performance.
- Full cycle detection FG servo with quartz phase locked control assures unbeatable rotational accuracy.
- Dial scale and tonearm LED indicator on outside of upper cabinet make it easy to check on tonearm position.
- Record stabilizer and stroboscope built-in.
- 45 rpm single-play adaptor is located in turntable platter for pop-up convenience.
- Can be run on either AC or DC (12V) current. DC adaptor optionally available for car battery use.

Troubleshooting guide

Problems	Causes	Solutions
■ **Unit does not turn on when power switch is pressed (no power).** The tonearm indicator and stroboscope do not light up.	• Power cord not plugged in. • The amp is not turned on. (This applies when the SL-7 is plugged into amp's "switched" AC outlet.)	• Check all connections. • Turn on amp.
■ **Power switch is turned on but there is no sound (during record play).**	• Packing screws and spacers have not been removed. • Speaker cords are disconnected. • Phono output cords are disconnected from amp's phono input jacks. • Amp's tape monitor switch is set to "tape" position. • Amp's input source selector is set to "tuner" or "aux". • Amp's speaker selector is at "off" position. • Amp's volume is turned all the way down.	• Remove packing material. • Connect speaker cables. Check correct polarity (+ and −). • Connect phono output cords. Check correct L and R connections. • Set to "source" when not playing tapes. • Set to "phono". • Set to "main" or "remote". • Turn up volume.
■ **Auto-play does not begin when start button is pressed.**	• The tonearm is locked. • The record is transparent.	• Unlock the tonearm. • Set the disc size selector to the size of the record to be played.
■ **Volume is too low.**	• Amp muting is on.	• Set to 0 dB or off.
■ **There is a hum.**	• Ground is not connected. • The turntable is too close to the amplifier.	• Connect to amp's GND terminal. • Try reversing the AC power plug in the wall socket. • Place the turntable further away from the power amp (or integrated amp).
■ **Stylus skips grooves.**	• Record is warped. • Turntable is placed where it easily picks up vibrations. • Dust or dirt is on the stylus tip.	• Check for warps and try another record. • Set the turntable in a position where it will be less susceptible to external vibrations. • Set the stylus pressure to 1.5 g. • Clean stylus tip with accessory brush.
■ **Record sounds scratchy and/or muffled.**	• Record is scratched or damaged. • Record is dusty or dirty. • Stylus tip is dusty. • Stylus tip is worn.	• Adjust amp's tone controls to cut out high-frequency noise. • Use a record cleaner to remove dust and dirt from grooves. • Use the accessory brush to clean stylus tip. • If there is still noise when a good new record is played, you should replace the cartridge or stylus.
■ **During auto-play, the stylus does not drop into the lead-in grooves.**	• The record diameter does not conform to industry standards.	• Follow manual cueing procedure.
■ **Tonearm does not automatically return to the start position at the end of record.**	• Record does not conform to industry standard dimensions.	• Press the stop button.
■ **Auto-return occurs during record play.**	• A voltage drop in the AC mains supply due to lightning or other damage. This is not an indication of damage to the turntable.	• This is the same as normal auto-return, so press the start button to begin record play again.

Quick Reference Chart for Start and Stop Button Operation

Button pressed / Cueing up/down	Start Button				Stop Button			
	Pressed momentarily (less than one second)	Pressed intermittently	Pressed continuously		Pressed momentarily (less than one second)	Pressed intermittently	Pressed continuously	
			Lightly ◁ ◄	Hard ◄ ◄			Lightly ► ▷	Hard ► ►
Cueing up (▼)	———	Tonearm moves inward in small steps.	Tonearm moves inward.	Moves faster.	———	Tonearm moves outward in small steps.	Tonearm moves outward.	Moves faster.
Cueing down (▼)	Tonearm rises and returns to start position and begins play again.	———	Tonearm rises and moves inward.	Tonearm rises and moves faster.	Auto-return (reject)	———	Tonearm rises and moves outward.	Tonearm rises and moves faster.

Suggestions for safety

Before using this unit, be sure to read applicable items of the operating instructions and these safety suggestions carefully; and afterwards keep them handy for future reference. Take special care to follow the warnings indicated on the unit itself as well as in the operating instructions.

1. **Avoid places where there is water or humidity.**
   Do not use this unit near a bathtub, washbasin, swimming pool, or the like. Damp basements should also be avoided.
2. **Do not allow water or any foreign object to get inside this unit.**
   Do not place small metal objects or anything containing liquid on or near the unit.
3. **Avoid placement of the unit where it will be exposed to the direct rays of the sun, or where ventilation is inadequate.**
   Do not place this unit in a bookcase or between cabinets, unless proper ventilation is provided, or where curtains or furniture may obstruct the ventilation holes.
4. **Place this unit away from heat-emitting appliances.**
   Never place this unit on or near a radiator, heat register, stove, or any other heat-emitting equipment (including amplifiers).
5. **Placement**
   Place the unit on a stable, vibration-free, level shelf or stand.
6. **Use of a cart or stand.**
   When deciding on a cart or stand, be sure to use only with the cart or stand recommended by the manufacturer.
7. **Wall or ceiling installation.**
   If the unit is to be mounted on a wall or ceiling, be sure to do so only as recommended by the manufacturer.
8. **Check the voltage rating of this unit before connecting the unit to a power source.**
   Be sure to connect the unit only to the type of power source indicated in the operating instructions, or as indicated on the unit itself.
9. **Care of the power cord and plug.**
   Take care that the cord is not bent sharply (especially near its connection to the unit or near the plug), that nothing is placed on it, and that it is not pinched, crushed or frayed. Never take hold of the plug or cord if your hand is wet, and always be sure to grasp the plug body when connecting or disconnecting it.
10. **If the unit will not be used for an extended period of time:**
    Be sure to disconnect the power cord from the wall outlet.
11. **Maintenance**
    Refer to the operating instructions for details.
12. **Never attempt repairs yourself:**
    (a) If the power cord or plug is damaged.
    (b) If a foreign object has fallen or liquid has spilled into it.
    (c) If the unit is exposed to rain.
    (d) If the unit does not function normally, or if operation shows a distinct change in performance.
    (e) If the unit has been dropped and the cabinet or chassis are damaged...etc.
    Unplug the power cord and have it checked by a qualified technician (or the dealer from whom the unit was purchased or the nearest service center).
13. **Repairs**
    Except for adjustments explained in the operating instructions, do not attempt any repairs yourself. Be sure to request service from a qualified technician (or your dealer or nearest service center).

Specifications

■ General

Power supply:	~110-120/220-240V, 50 or 60 Hz DC 12V (DC input jack)
Power consumption:	20 W (AC) 6 W (DC)
Dimensions: **(W×H×D)**	31.5 × 8.8 × 31.5 cm (12-1/2" × 3-1/2" × 12-1/2")
Weight:	7 kg (15.4 lbs.)

■ Turntable section

Type:	Quartz direct drive Automatic turntable Auto start/Auto lead-in Auto return Auto stop Repeat play Auto speed select Auto size select 2-speed search functions Record presence detection
Drive method:	Direct drive
Motor:	Brushless DC motor
Drive control method:	Quartz-phase-locked control
Turntable platter:	Aluminum die-cast Diameter 30 cm (12 inches)
Turntable speeds:	33-1/3 rpm and 45 rpm Auto speed select (Manual selection possible)
Speed deviation:	Within ±0.002%
Wow and flutter:	0.012% WRMS* 0.025% WRMS (JIS C5521) ±0.035% peak (IEC 98A Weighted)

*Measured by obtaining signal from built-in frequency generator of motor assembly.

Rumble:	−56 dB (IEC 98A Unweighted) −78 dB (IEC 98A Weighted)

■ Tonearm section

Type:	Dynamic balanced type Linear tracking tonearm 4-pivot gimbal suspension
Effective length:	10.5 cm (4-1/8")
Tracking error angle:	Within ±0.1°
Effective mass:	9 g (including cartridge)
Resonance frequency:	12 Hz
Tonearm drive motor:	Coreless DC motor

■ Cartridge section

Model No:	EPC-P202CB
Type:	Moving magnet stereo cartridge One point suspension system
Magnet:	Samarium cobalt (Sm-Co)
Cantilever:	Pure boron pipe
Magnetic circuit:	All laminated core
Frequency response:	10 Hz to 35 kHz 20 Hz to 10 kHz ±1 dB
Output voltage:	2.5 mV at 1 kHz, 5 cm/s. zero to peak lateral velocity (7 mV at 1 kHz, 10 cm/s. zero to peak 45° velocity [DIN 45 500])
Channel separation:	More than 22 dB at 1 kHz
Channel balance:	Within 1.8 dB at 1 kHz
Recommended load impedance:	47 kΩ~100 kΩ
Compliance (dynamic):	12×10^{-6} cm/dyne at 100 Hz
Vertical tracking angle:	20°
Stylus pressure range:	1.25 ±0.25 g (12.5 ±2.5mN)
Stylus tip:	0.3 × 0.7 mil (7.5 × 18μm) Elliptical stylus
Weight:	6.0 g (cartridge only)
Replacement stylus:	EPS-202ED

■ Circuit components

Microprocessor	1
ICs	7
Quartz crystal oscillator	1
Phototransistors	5
LEDs	12
Transistors	28
Diodes	20

■ Accessories supplied:

Stylus cleaning brush	1
Screwdriver	1

Specifications subject to change without notice.
Weight and dimensions shown are approximate.

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